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A COMPARISON OF CALLS SUBJECTED TO A MALPRACTICE CLAIM VERSUS "NORMAL CALLS" WITHIN THE SWEDISH HEALTHCARE DIRECT – OPEN-ENDED QUESTIONS MATTER

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TITLE PAGE**A COMPARISON OF CALLS SUBJECTED TO A MALPRACTICE CLAIM VERSUS
“NORMAL CALLS” WITHIN THE SWEDISH HEALTHCARE DIRECT – OPEN-
ENDED QUESTIONS MATTER**

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Malpractice claims within the Swedish Health Care Direct

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Word Count:

Abstract

In many countries, telephone advice nursing is patients' first contact with healthcare. Telenurses' assessment of callers' symptoms and needs are based on verbal communication only, and problems with over- and under-triage have been reported. The aim of this study is to offer further suggestions for how to provide safe telephone advice nursing, by comparing communication patterns in calls subjected to a malpractice claim and matched control calls. The study used a case-control design. Male patients were in majority (n=16), and the most common reasons for calling were abdominal pain (n=10) and chest pain (n=5). There were statistically significant differences between the communication in the cases and controls: telenurses used fewer open-ended medical questions ($p<0.001$) in the cases compared to the control calls; callers provided telenurses with more medical information in the control calls compared to the cases ($p=0.001$); and telenurses used more facilitation and patient activation activities in the control calls ($p=0.034$), such as back-channel response ($p=0.001$), compared to the cases. The present study shows that telenurses in malpractice claimed calls used more closed-ended questioning compared to those in control calls, who used more open-ended questioning and back-channel response, which provided them with richer medical descriptions and more information from the caller. Hence, these communicative techniques should be taught and used in clinical practice.

Article summary

Strengths and limitations of this study

- This is the first study to compare authentic calls, subjected to malpractice claims, to matched controls e.g. normal calls to Sweden's national telephone advice nursing service (SHD)
- Open-ended medical questions and back-channel response e.g. attentive listening from telenurses were more common in control calls, which indicate that these strategies might enhance patient safety in telephone advice nursing services.
- Using open-ended medical questions do not lengthen call-time
- The present study includes a small sample of calls (n=52, in a Swedish context. However, it consisted of a total sample of authentic malpractice claimed calls during the time period, and matched controls.

A comparison of calls containing medical errors versus “normal calls” within the Swedish Healthcare Direct – open-ended questions matter

Introduction

Telephone advice nursing plays a crucial role in healthcare organizations through the assessment of callers' symptoms and the steering of patient flows to the right level of care. These services are complex, and some studies have shown that they may compromise patient safety.^{1,2} AAACN (2007) has defined telephone advice nursing as: “Telephone advice nursing, or in short “telenursing” including telephone triage, is defined as the practice of providing “a component of telephone nursing practice that focuses on assessment, prioritization, and referral to the appropriate levels of care” and “identifying the nature and urgency” of a caller's or patient's needs “. Telephone advice nursing, performed by registered nurses (RNs), in this study referred to as telenurses, and has been described as the most vulnerable form of out-of-hours healthcare.³⁻⁶ Among the problems with the service, over- and under-triage have been described in several international studies.^{2, 7-9} A systematic review¹⁰ showed that as much as 10% of telephone advice was unsafe. The studies included in the review that had used simulated patients showed that an average of 50% of the contacts was unsafe. In many countries telephone advice nursing is the patient's first contact with healthcare, and the service entails a large number of patient contacts.¹¹⁻¹³ Given this large number, the effects of unsafe telephone advice nursing could be substantial on a population level.¹⁰

Telephone advice nursing is a growing service in many countries (the UK, the US, Canada, Sweden, Denmark and the Netherlands), with the aim to provide increased accessibility to qualified healthcare advice and to rationalize limited healthcare resources. The

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2
3 service in Sweden, called Swedish Healthcare Direct (SHD), is staffed by RNs who
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5 independently triage callers' need of care, give self-care advice and/or refer the caller to an
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7 appropriate level of care, with the assistance of a computerized decision support system
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9 (CDSS).^{14 15} The service is provided by 33 call centres ¹⁶, located all over the country and
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11 connected through a network which provides, e.g., CDSS and in-house education. Currently
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13 1,100 telenurses are employed in this service, which handled over five million calls in 2013¹⁷.
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15 They are subjected to many challenging demands, including employers' demands for
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17 efficiency ¹⁴ in addition to the correct and accurate triaging of callers' need of care.
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20 Communication is hence essential in telephone advice nursing. Not only do telenurses need to
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22 ask accurate questions; they also need to use active listening and, through their
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24 communication, create a trusting and caring relationship with the caller.¹⁸⁻²⁰ These are factors
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26 that have been shown to correlate with positive health effects. ²¹ To sum up, the telenurses
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28 have a demanding job, as they are expected to provide expert, individualized care based solely
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30 on verbal communication, while also acting as gatekeepers for the healthcare sector.¹⁸ Their
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32 professional practice includes great risks of making the wrong assessments, and subsequently
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34 be subjected to malpractice claims.
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39 We have previously investigated malpractice claimed calls in SHD. When a
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41 patient in Sweden is exposed to, or subjected to a medical error, a malpractice claim is filed
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43 with the National Board of Health and Welfare (NBHW), by the health-care provider or the
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45 patient. A medical error can be defined as "the failure of a planned action to be completed as
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47 intended or the use of a wrong plan to achieve an aim".²² In an investigation of reported
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49 malpractice claimed calls (n=33) in the context of telephone advice nursing in Sweden ²³,
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51 communication failure was found to be the most common reason for these errors. The
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53 outcome for these malpractice claims was severe; 13 of the patients died and 12 were
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55 admitted to ICU. The study showed that the telenurses in these calls asked the callers too few
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3 questions and failed to listen to them. Safety risks in telephone advice nursing might be
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5 related to gathering partial information from callers, communicating with callers with
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7 language problems, or callers behaving in a way that hinders communication (such as being
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9 very angry); but the greatest risk seemed to be uncertainty due to the inability to see the caller
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11 in person.²⁴ Another safety risk within telephone advice nursing is not talking directly with the
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13 patient in need of care.²³ Second-hand communication has also been shown to contribute to
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15 increased safety risks in the context of emergency dispatch calls.²⁵
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21 Fernald et al.²⁶ have shown that as much as 70% of all medical errors within
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23 primary healthcare are related to communication problems. Communication failure has also
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25 been shown to be the most common reason for patient safety risks, as well as the most
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27 common cause of adverse events.^{23, 27-30} This likely also holds true for telephone advice
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29 nursing services, in which the assessment of healthcare needs is based solely on verbal
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31 communication. When searching the literature, there are no descriptions found of how
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33 communication in telephone advice nursing should be conducted to achieve safe
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35 communication, and what communicative patterns characterized safe and more unsafe calls.
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37 We believe that the potential differences found when calls subjected to a malpractice claim
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39 are compared to matched controls might shed light on both safe and unsafe communication
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41 practices via telephone.
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46 The aim of this study is to offer further suggestions for how to provide safe
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48 communication within telephone advice nursing, by comparing communication patterns in
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50 calls subjected to a malpractice claimed and matched controls.
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56 **Methods**

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Design

The study used a case-control design.

Sample

A total sample of all reported medical errors (n=33) during the period 2003-2010 within Swedish Healthcare Direct was retrieved from the National Board of Health and Welfare, responsible for such investigations. Corresponding calls were thereafter collected from the manager in charge at the respective call centres. In Sweden, all calls to SHD are recorded and stored as a sound file in a call data base, connected to the patient record for a minimum of ten years. The managers in charge are responsible for these stored calls. For technical reasons, calls from four of the cases were not possible to retrieve. The 29 retrieved cases' calls were analysed, with the aim to describe all malpractice claims regarding SHD during 2003-2010, regarding the communication between telenurses and callers. These results are presented elsewhere²³. For the present study, matched controls based on the patient's age, gender and main symptom presented were collected from the call databases at SHD, with the assistance from the managers in charge. For three of the cases, it was not possible for the respective managers in charge to find matched controls in their call database, despite the large numbers of calls made to SHD every year. Hence, the present study consists of 26 cases and 26 matched controls, making a total of 52 calls. The cases and controls were spread over a period of time from the introduction of SHD in 2003 until 2013 and fielded by different telenurses. The 26 cases and 26 matched controls each contained 16 male and 10 female patients. Patient age varied from 2 years to 85 years; mean age 44 years, SD 23.7. The most common reasons for calling were abdominal pain (n=10), chest pain (n=5), dizziness (n=3) and breathing problems (n=2).

Data analysis

All calls were analysed using the Roter Interaction Analysis System (RIAS),³¹ a commonly used instrument for describing provider-patient communication in various medical contexts. The communication was coded as frequency of utterances and of statements, and as a proportion of statements in a given category relative to all nurse/caller statements during the call. All coding was conducted by the first author (AE) while the last authors (IKH) double coded 18 calls. Inter-rater reliability calculation, using intra-class correlation (ICC), ranged from 0.76-0.91. Both coders are trained in RIAS coding and are experienced telenurses. Data were imported into IBM SPSS Statistics 20 for statistical analysis. Differences in communication between cases and matched controls were compared using the Wilcoxon Signed Rank Test.³² To control/adjust for differences in call length between the cases and matched controls, utterances in a category are presented as percentage of total utterances (i.e., utterances in the category divided by all utterances made by the caller or telenurse). Comparison between cases and matched controls was performed in all RIAS categories (n=13) and composite categories (n=49). Bonferroni adjustment was used with an adjusted p-value of 0.001 for all statistical tests to control for type-1 error.³³

Results

Call length varied from 1 min 50 sec to 20 min 10 sec (mean 5 min 50 sec) for the cases, and from 59 sec to 20 min 44 sec (mean 5 min 30 sec) for the controls; $p=0.377$ (paired t-test). All calls, both cases and controls, were slightly provider-driven, with a ratio of telenurse/caller talk of 1.31 (SD 0.24) in the cases, versus a ratio of 1.28 (SD 0.30) in the controls ($p=0.424$).

Analysis of actual communication showed how telenurses asked more *open-ended medical questions* in the control calls (mean 9.6, SD 4.5) than in the case calls (mean 2.6, SD 3.0),

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3 p<0.001. The use of *back-channel response* e.g. indicator or sustained interest, attentive
4 listening or encouragement emitted by the telenurses when not holding the speaking floor
5 (Mmmm-huh; yeah; go on) by telenurses was also significantly more common in the controls
6 (mean 28.8, SD 11.3) than in the cases (mean 15.9, SD 10.1) (p=0.001); see Table I. When
7 analysing the callers' communication, the analysis showed that callers provided statistically
8 significantly more *medical information* (mean 54.9, SD 13.2) in the controls than in the cases
9 (mean 38.9, SD 13.4), p=0.001, and that callers in the cases gave more lifestyle information
10 (mean 5.6, SD 5.4) than those in the controls (1.4, SD 3.6), p=0.001; see Table II.

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22 *//please insert Table I and Table II about here//*
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25 In the cases, telenurses were significantly more prone to *check their own understanding*
26 (mean 8.1, SD 5.1) than in the controls (mean 1.9, SD 2.6); p<0.001. Checking for one's own
27 understanding involves utterances like "*Did you say the chest pain started while walking in*
28 *stairs?*" Furthermore, communication analysis also showed that telenurses made more
29 *statements of agreement* in the cases (mean 15.6, SD 7.6) than in the controls (mean 2.4, SD
30 3.9) p<0.001. Typical examples of *statements of agreement* are "*You're probably right;*
31 *there's nothing to worry about*". Telenurses were reluctant to follow up on callers
32 understanding to given advice (*ask for callers understanding*) in both cases (mean 0.4, SD
33 1.7) as well as in controls (mean 0.3 SD 0.8).
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50 Discussion

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53 The present comparison of malpractice claimed calls in the context of SHD versus matched
54 controls showed that the telenurses in the control calls used more open-ended questions and
55 back-channel response, and were hence provided with more medical information by the
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3 callers than were the telenurses in the cases. These results show that the use of open-ended
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5 questions and back-channel response by telenurses seems to encourage callers to freely
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7 narrate their problem and reason for calling. This is in line with previous studies in other
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9 contexts^{34, 35, 35, 36} showing that the use of open-ended questions will improve patient safety and
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11 reduce patient complaints.³⁷ Interestingly, the use of open-ended questions did not increase
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13 the total time of the calls, as is also shown by Stewart et al.³⁸ However, using open-ended
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15 questions significantly increased the amount of medical information the callers provided the
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17 telenurses with. This likely contributes to increased safety, since it gives telenurses a better
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19 base for their decisions.^{27, 39, 40} Healthcare professionals' use of open-ended questioning is also
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21 a cornerstone in patient-centred communication. Typical of bio-medical communication, on
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23 the other hand, is the use of closed-ended questions and giving instructions without following
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25 up on the patient's understanding.⁴¹ This communication pattern was found in the present
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27 malpractice claimed cases. Neither in the cases nor the control calls the telenurses followed up
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29 on callers understanding to given advice (*ask for callers understanding*). This lack of follow
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31 up on callers understanding to advice given should be regarded as a clear threat to patient
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33 safety since it does not matter how correct the telenurses advices are if the caller do not
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35 understand what to do.
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42 Expressions of concern were quite common among callers in both the cases
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44 (mean 6.0, SD 4.5) and the controls (mean 3.7, SD 4.3) $p=0.071$, although we had expected
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46 there to be more expressions of concern among the cases. Price's²⁷ study in a paediatric
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48 setting suggests that it is important that parents' concern is taken seriously, since they are
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50 often good judges of their child's condition. Hence, taking an adequate history and listening
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52 to the patient's story are again all-important issues.²⁷ Among the control calls, telenurses
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54 were more prone to use ***Facilitation and patient activation*** ($p=0.003$), see Table 1, which
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56 include asking for callers opinion, understanding to advice given and using back-channel
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3 response to show interest in what the caller is saying. A Dutch study⁴² suggests that
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5 telenurses should use these communicative strategies to improve the quality of
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7 communication. The use of patient activation strategies has also been shown to increase
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9 concordance.⁴³ Achieving concordance is essential for callers to follow through with the
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11 advice provided by the telenurses.²⁰ This finding is puzzling – i.e., why do the telenurses in
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13 the cases use less patient activating strategies? – and needs to be investigated in further
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15 studies.
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19 In the calls subjected to malpractice claims, telenurses in the cases checked their
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21 own understanding more often than those in the controls, with questions like “*So you’ve had*
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23 *this chest pain for five hours?*”. These results are confusing; are they signs of insecurity or the
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25 result of a conscious strategy to assure correctness? Further analysis using an in-depth
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27 qualitative analysis of this data is necessary to answer this question.
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31 Interestingly, there were no significant differences between the cases (mean 1.2,
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33 SD 2.8) and the controls (mean 0.7, SD 1.8) $p=0.515$ regarding callers’ requests for service,
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35 e.g. referral to a doctor. These results show that callers in the cases might not have been aware
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37 of the severity of their medical condition. In the cases, there was a tendency of significance
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39 regarding telenurses’ expressions of reassurance (mean 4.3, SD 5.7) compared to the controls
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41 (mean 1.0, SD. 2.2), $p=0.01$. In a previous study²³ analysing communication in the
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43 malpractice claimed calls, there was a significant relationship between callers’ expressions of
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45 concern and telenurses’ utterances of reassurance during calls.
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49 The findings from the present study could be used for educational interventions
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51 in clinical settings, as well as for in-house training for telenurses. However, in addition to the
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53 present RIAS analysis³¹, more in-depth qualitative analyses –of for instance turn-taking and
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3 nurses' responses to callers' cues – should be valuable. Further research on larger samples
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5 might include studies of well-functioning calls and the communication patterns in them.
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10 11 **Limitations**

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14 The present study includes a small sample of calls, in a Swedish context. However, it
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16 consisted of a total sample of authentic malpractice claimed calls during the time period, and
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18 matched controls. The RIAS coding was conducted by trained coders, with high inter-rater
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20 reliability ranging from 0.76-0.91.
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27 **Conclusions**

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30 The present study shows that telenurses in malpractice claimed calls used more closed-ended
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32 questioning compared to those in control calls, who used more open-ended questioning and
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34 back-channel response, which provided them with richer medical descriptions and more
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36 information from the caller. Hence, using open-ended questions and telenurses encouraging
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38 callers to freely describe their problems and reason for calling should be taught and used in
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40 clinical practice. Further studies including telenurses subjected to a malpractice claim, using
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42 qualitative methods might deepen the understanding of why telenurses were prone to use
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44 close-ended questions.
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51 **Ethical considerations**

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54 The study was approved by the Regional Ethical Review Board in Uppsala (na.2010/008) and
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56 the Swedish National Board of Health and Welfare (NBHW) (act number 3.1 35689/2010).
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Contributorship statement

- AE contributed to planning and designing study, data collection, data analysis and drafting of manuscript
- ME contributed to planning and designing study, data analysis and drafting of manuscript
- UWS contributed to planning and designing study and drafting of manuscript
- IKH contributed to planning and designing study, data analysis and drafting of manuscript

No additional data available

Competing interests

None

Table I

Comparison of telenurses' communication in the group cases versus control, presented as percentage of total utterances

Nurse talk	Case n=26	Control n=26	<i>p</i> -value ¹
Composite category/category	Mean (SD)	Mean (SD)	
Data gathering – biomedical	17.5 (10.2)	24.7 (10.6)	0.032
a) Closed - medical question	9.5 (5.5)	12.8 (7.8)	0.112
b) Closed - therapeutic question	2.3 (3.0)	0.9 (1.9)	0.058
c) Closed - other question	2.3 (2.5)	0.5 (0.3)	<i>p</i><0.001
d) Open - medical question	2.6 (3.0)	9.6 (4.5)	<i>p</i><0.001
e) Open - therapeutic question	0.2 (0.6)	0.9 (1.3)	0.013
f) Open - other question	0.2 (0.6)	0.4 (0.7)	0.575
g) Bid for repetition	0.3 (0.7)	0.1 (0.5)	0.225
Facilitation and patient activation	25.8 (11.7)	35.3 (11.4)	0.003
a) Ask for opinion	1.1 (1.5)	0.3 (0.7)	0.034
b) Ask for permission	0.3 (0.8)	0.08 (0.04)	0.225
c) Ask for reassurance	0	0	1.0
d) Ask for callers understanding	0.4 (1.7)	0.3 (0.8)	0.575
e) Back-channel	15.9 (10.1)	28.8 (11.3)	0.001
f) Check own understanding	8.1 (5.1)	1.9 (2.6)	<i>p</i><0.001
Rapport-building/positive	16.5 (7.8)	14.7 (8.6)	0.341
a) Laugh	0.1 (0.5)	1.1 (3.6)	0.116
b) Express Approval	0.7 (1.1)	0.5 (1.1)	0.470
c) Give Compliments	0	0	1.0
d) Agree	15.6 (7.6)	2.4 (3.9)	<i>p</i><0.001
Rapport-building/positive	6.0 (6.1)	2.9 (3.3)	0.024
a) Express empathy	0.5 (0.9)	0.8 (1.3)	0.433
b) Legitimize	0.6 (1.4)	0.2 (0.6)	0.161
c) Express concern	0.3 (0.8)	0.9 (1.2)	0.030
d) Reassures	4.3 (5.7)	1.0 (2.2)	0.010
e) Make partnership statement	0.3 (0.8)	0	0.109
f) Self-disclosure	0.02 (0.1)	0	0.317

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) and composite categories with a tendency toward significance ($p = 0.01$) are presented. Statistically significant values are marked with bold text.

Table II

Comparison of callers' communication in the group cases versus control, presented as percentage of total utterances

Caller talk	Case n=26	Control n=26	<i>p-value</i> ¹
Composite category/category	Mean (SD)	Mean (SD)	
Information giving – biomedical	47.4 (16.6)	60.7 (13.7)	0.003
a) Give medical information	38.9 (13.4)	54.9 (13.2)	0.001
b) Give therapeutic information	5.9 (7.4)	4.4 (6.9)	0.478
c) Give other information	3.7 (3.6)	1.4 (2.1)	0.006
Information giving – lifestyle/psychological	6.0 (6.1)	2.0 (3.7)	0.002
a) Give information – lifestyle	5.6 (5.4)	1.4 (3.6)	0.001
b) Give information – psychological	0.4 (1.4)	0.6 (1.2)	0.401
Rapport-building/emotional	6.3 (4.6)	3.7 (4.3)	0.058
a) Express empathy	0.6 (0.3)	0	0.317
b) Legitimize	0	0	1.0
c) Express concern	6.0 (4.5)	3.7 (4.3)	0.071
d) Reassure	0.2 (0.9)	0	0.180

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) are presented, and the category Rapport-building/emotional was of interest based on a previous study. Statistically significant values are marked with bold text.

Contributorship

- AE contributed to planning and designing study, data collection, data analysis and drafting of manuscript
- ME contributed to planning and designing study, data analysis and drafting of manuscript
- UWS contributed to planning and designing study and drafting of manuscript
- IKH contributed to planning and designing study, data analysis and drafting of manuscript

Competing Interests

None

Data Sharing Statement

No additional data available

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For peer review only

STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	<i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls
		<i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding
		(b) Describe any methods used to examine subgroups and interactions
		(c) Explain how missing data were addressed
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy
		(e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

A COMPARISON OF CALLS SUBJECTED TO A MALPRACTICE CLAIM VERSUS "NORMAL CALLS" WITHIN THE SWEDISH HEALTHCARE DIRECT – A CASE CONTROL STUDY

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5 **TITLE PAGE**
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8 **A COMPARISON OF CALLS SUBJECTED TO A MALPRACTICE CLAIM VERSUS**
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10 **“NORMAL CALLS” WITHIN THE SWEDISH HEALTHCARE DIRECT – A CASE**
11
12 **CONTROL STUDY**
13

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41 Malpractice claims within the Swedish Health Care Direct
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43 *Key words: Telenursing, Patient Safety, Communication, Medical Errors*
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46 Word Count:
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Abstract

Objectives: The purpose of this study is to compare communication patterns in calls subjected to a malpractice claim with matched controls.

Setting: In many countries, telephone advice nursing is patients' first contact with healthcare. Telenurses' assessment of callers' symptoms and needs are based on verbal communication only, and problems with over- and under-triage have been reported.

Participants: A total sample of all reported medical errors (n=33) during the period 2003-2010 within Swedish Healthcare Direct was retrieved. Corresponding calls were thereafter identified and collected as sound files from the manager in charge at the respective call centres. For technical reasons, calls from four of the cases were not possible to retrieve. For the present study, matched control calls (n=26) based on the patient's age, gender and main symptom presented by the caller were collected

Results: Male patients were in majority (n=16), and the most common reasons for calling were abdominal pain (n=10) and chest pain (n=5). There were statistically significant differences between the communication in the cases and controls: telenurses used fewer open-ended medical questions ($p<0.001$) in the cases compared to the control calls; callers provided telenurses with more medical information in the control calls compared to the cases ($p=0.001$); and telenurses used more facilitation and patient activation activities in the control calls ($p=0.034$), such as back-channel response ($p=0.001$), compared to the cases.

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3 **Conclusions:** The present study shows that telenurses in malpractice claimed calls used more
4 closed-ended questioning compared to those in control calls, who used more open-ended
5 questioning and back-channel response, which provided them with richer medical descriptions
6 and more information from the caller. Hence, these communicative techniques are important
7 in addition to solid medical and nursing competence and sound decision aid systems.
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14 15 16 17 18 19 20 **Article summary**

21 Strengths and limitations of this study

- 22 • This is the first study to compare authentic calls, subjected to malpractice claims, to
23 matched controls e.g. normal calls to Sweden's national telephone advice nursing
24 service (SHD)
25
- 26 • Open-ended medical questions and back-channel response e.g. attentive listening from
27 telenurses were more common in control calls, which indicate that these strategies
28 might enhance patient safety in telephone advice nursing services.
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- 30 • Using open-ended medical questions do not lengthen call-time
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- 32 • The present study includes a small sample of calls (n=52), in a Swedish context.
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34 However, it consisted of a total sample of authentic malpractice claimed calls during
35 the time period, and matched controls.
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A comparison of calls containing medical errors versus “normal calls” within the Swedish Healthcare Direct – open-ended questions matter

Introduction

Telephone advice nursing plays a crucial role in healthcare organizations through the assessment of callers' symptoms and the steering of patient flows to the right level of care. These services are complex, and some studies have shown that they may compromise patient safety.^{1,2} AAACN (2007) has defined telephone advice nursing as: “Telephone advice nursing, or in short “telenursing” including telephone triage, is defined as the practice of providing “a component of telephone nursing practice that focuses on assessment, prioritization, and referral to the appropriate levels of care” and “identifying the nature and urgency” of a caller’s or patient’s needs “. Telephone advice nursing, in Sweden performed solely by registered nurses (RNs), here referred to as telenurses, has been described as the most vulnerable form of out-of-hours healthcare.³⁻⁶ However, it should be noted that the competence and education in telenursing differ between countries. In UK, for instance, caller first have to talk to a so called call-handler, how then might transfer the call to a registered nurse, if deemed appropriate. Among the problems with the service, over- and under-triage have been described in several international studies.^{2,7-9} A systematic review¹⁰ showed that as much as 10% of telephone advice was unsafe. The studies included in the review that had used simulated patients showed that an average of 50% of the contacts was unsafe. In many countries telephone advice nursing is the patient’s first contact with healthcare, and the service entails a large number of patient contacts.¹¹⁻¹³ Given this large number, the effects of unsafe telephone advice nursing could be substantial on a population level.¹⁰

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3 Telephone advice nursing is a growing service in many countries (the UK, the
4 US, Canada, Sweden, Denmark and the Netherlands), with the aim to provide increased
5 accessibility to qualified healthcare advice and to rationalize limited healthcare resources. The
6 service in Sweden, called Swedish Healthcare Direct (SHD), is staffed by RNs who
7 independently triage callers' need of care, give self-care advice and/or refer the caller to an
8 appropriate level of care, with the assistance of a computerized decision support system
9 (CDSS).^{14 15} The CDSS used in Sweden could be entered either by symptom or by diagnosis,
10 covering various symptoms and conditions among children, adolescents, adults and older
11 people. It suggests key-questions based on the caller's symptom, and severe main symptoms
12 are regarded as acute until proven not, e.g. chest-pain. The recommendation levels within the
13 CDSS vary from ambulance dispatch to self-care advice¹⁶. The CDSS in used in Sweden is
14 constantly revised by medical experts and the users (telenurses) have the possibility to report
15 problems with the CDSS to the system developers. The outcome of telenurses triage of callers
16 has in international studies varied from 58% accuracy¹⁴ to 97.6%¹⁶. There is however, also
17 another factor to consider in addition to the accuracy of the CDSS, namely the human factor.
18 No matter how accurate the CDSS is if the users do not use the system as intended. Several
19 studies¹⁷⁻²⁰ have described both how telenurses in Sweden¹⁷ as well as in the UK^{18,19} stated
20 that they did not always use the CDSS as intended. As their knowledge about the CDSS
21 increase, they are able to select the "proper" main-symptom to enter, enabling them to choose
22 a route through the software that matches their own understanding of the symptoms and its
23 cause, hence using the CDSS to confirm their decisions rather than excluding severe
24 symptoms¹⁸. In our previous study of malpractice claimed calls²¹, the root-cause analysis
25 performed by the National Board of Health and Welfare (NBHW), showed that the most
26 common reasons (please note that more than one reason could be identified for the same
27 case) for the malpractice claims were communication failure (n=35). These communicative

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3 failures consisted of: failure to listen to the caller (n=12), communication failure (n=11) and
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5 telenurses asking the caller too few questions (n=10). The investigation also showed how
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7 telenurses in seven cases failed to follow the guidelines of the CDSS, or did not use the CDSS
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9 at all. The NBHW's investigations also showed how deficiency in the CDSS (n=5)
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11 contributed to the cases ²¹.

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14 The service in Sweden is provided by 33 call centres ²², located all over the
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16 country and connected through a network which provides, e.g., CDSS and in-house education.
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18 Currently 1,100 telenurses are employed in this service, which handled over five million calls
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20 in 2013²³. They are subjected to many challenging demands, including employers' demands
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22 for efficiency ¹⁴ in addition to the correct and accurate triaging of callers' need of care.
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24 Communication is hence essential in telephone advice nursing. Not only do telenurses need to
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26 ask accurate questions; they also need to use active listening and, through their
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28 communication, create a trusting and caring relationship with the caller.²⁴⁻²⁶ These are factors
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30 that have been shown to correlate with positive health effects. ²⁷ To sum up, the telenurses
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32 have a demanding job, as they are expected to provide expert, individualized care based solely
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34 on verbal communication, while also acting as gatekeepers for the healthcare sector.²⁵ Their
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36 professional practice includes great risks of making the wrong assessments, and subsequently
37
38 be subjected to malpractice claims.

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41 We have previously investigated malpractice claimed calls in SHD²¹. When a
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43 patient in Sweden is exposed to, or subjected to a medical error, a malpractice claim is filed
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45 with the National Board of Health and Welfare (NBHW), by the health-care provider or the
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47 patient. A medical error can be defined as "the failure of a planned action to be completed as
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49 intended or the use of a wrong plan to achieve an aim"²⁸. In an investigation of reported
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51 malpractice claimed calls (n=33) in the context of telephone advice nursing in Sweden ²¹,
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53 communication failure was found to be the most common reason for these errors, as described
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3 above. The outcome for these malpractice claims was severe; 13 of the patients died and 12
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5 were admitted to ICU. The study showed that communication problems (n=35) was the most
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7 commonly described reason for the errors to occur, according what to the NBHW's
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9 investigation. Hence, the telenurses in these calls asked the callers too few questions and
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11 failed to listen to them. Safety risks in telephone advice nursing might be related to gathering
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13 partial information from callers, communicating with callers with language problems, or
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15 callers behaving in a way that hinders communication (such as being very angry); but the
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17 greatest risk seemed to be uncertainty due to the inability to see the caller in person.²⁹ Another
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19 safety risk within telephone advice nursing is not talking directly with the patient in need of
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21 care.²¹ Second-hand communication has also been shown to contribute to increased safety
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23 risks in the context of emergency dispatch calls.³⁰
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30 Fernald et al.³¹ have shown that as much as 70% of all medical errors within
31
32 primary healthcare are related to communication problems. Communication failure has also
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34 been shown to be the most common reason for patient safety risks, as well as the most
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36 common cause of adverse events.^{21, 32-35} This likely also holds true for telephone advice
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38 nursing services, in which the assessment of healthcare needs is based solely on verbal
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40 communication. When searching the literature, there are no descriptions found of how
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42 communication in telephone advice nursing should be conducted to achieve safe
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44 communication, and what communicative patterns characterized safe and more unsafe calls.
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46 We believe that the potential differences found when calls subjected to a malpractice claim
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48 are compared to matched controls might shed light on both safe and unsafe communication
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50 practices via telephone.
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3 The aim of the present study was to compare communication patterns in calls
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5 subjected to a malpractice claim with matched controls.
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10 11 **Methods**

12 13 14 **Design**

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17 The study used a case-control design.
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20 21 **Sample**

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23 A total sample of all reported medical errors (n=33) during the period 2003-2010 within
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25 Swedish Healthcare Direct was retrieved as text documents from the National Board of Health
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27 and Welfare (NBHW), responsible for such investigations. Corresponding calls were
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29 thereafter identified and collected as sound files from the manager in charge at the respective
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31 call centres. In Sweden, all calls to SHD are recorded and stored as a sound file in a call data
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33 base, connected to the patient record for a minimum of ten years. The managers in charge are
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35 responsible for these stored calls. For technical reasons, calls from four of the cases were not
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37 possible to retrieve. The 29 retrieved cases' calls were analysed, with the aim to describe all
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39 malpractice claims regarding SHD during 2003-2010, regarding the communication between
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41 telenurses and callers. These results are presented elsewhere²¹. For the present study, matched
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43 control calls based on the patient's age, gender and main symptom presented by the caller
44
45 were collected from the call databases at SHD, by the managers in charge, as the researchers
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47 were not allowed direct access to the database due to ethical regulations. The control calls
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49 sound files were sent to the researchers via USB memory in registered letters. For three of the
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51 cases, it was not possible for the respective managers in charge to find matched controls in
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53 their call database, despite the large numbers of calls made to SHD every year. Several
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3 reminders were sent to the managers in charge in an attempt to retrieve control calls. The
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5 three cases which the managers were unable to find controls to were excluded from the
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7 present study. Hence, the present study consists of 26 cases and 26 matched controls, making
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9 a total of 52 calls. The cases and controls were spread over a period of time from the
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11 introduction of SHD in 2003 until 2010 and fielded by different telenurses. The 26 cases and
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13 26 matched controls each contained 16 male and 10 female patients. Patient age varied from 2
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15 years to 85 years; mean age 44 years, SD 23.7. The most common reasons for calling were
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17 abdominal pain (n=10), chest pain (n=5), dizziness (n=3) and breathing problems (n=2).
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20 21 22 23 24 **Data analysis**

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27 All authentic calls were analysed using the Roter Interaction Analysis System (RIAS),³⁶ a
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29 commonly used instrument for describing provider-patient communication in various medical
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31 contexts. In RIAS coding, all communication between the telenurses and the caller is divided
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33 into small units defined as “utterances”, e.g. the smallest speech segment to which a
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35 classification can be assigned. Coding is performed directly from sound files. During analysis,
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37 the authentic communication between telenurses and callers was coded as frequency of
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39 utterances and of statements, and as a proportion of statements in a given category relative to
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41 all nurse/caller statements during the call. Each single utterance is later categorised into one of
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43 the 41 exhaustive and exclusive RIAS categories. The categories are combined into composite
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45 categories according to the developers of the RIAS³⁶. In the previous study of the malpractice
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47 claimed calls²¹, we have focused the result on 11 of the 41 categories, identifying patient-
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49 centred behaviour such as telenurses usage of open-ended questions and follow-up on callers
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51 understanding according guidelines³⁷⁻³⁹. Several of the categories were not present in the calls,
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53 probably explained by the context of the study. Analysis began with listening to the calls in
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3 order to attain an understanding of them. Calls were then analysed based on the
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5 recommendations of the RIAS manual ³⁶, and utterances were identified and placed into one
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7 of the categories, see Table 1 and 2. The control calls were analysed during autumn 2013. All
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9 coding was conducted by the first author (AE) while the last authors (IKH) double coded 18
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11 calls. Inter-rater reliability calculation, using intra-class correlation (ICC), ranged from 0.76-
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13 0.91. Both coders are trained in RIAS coding and are experienced telenurses. Data were
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15 imported into IBM SPSS Statistics 20 for statistical analysis. Differences in communication
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17 between cases and matched controls were compared using the Wilcoxon Signed Rank Test.⁴⁰
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19 To control/adjust for differences in call length between the cases and matched controls,
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21 utterances in a category are presented as percentage of total utterances (i.e., utterances in the
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23 category divided by all utterances made by the caller or telenurses). Comparison between
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25 cases and matched controls was performed in all RIAS categories (n=49) and composite
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27 categories (n=13). Bonferroni adjustment was used with an adjusted p-value of 0.001 for all
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29 statistical tests to control for type-1 error.⁴¹
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35 Results

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37 Call length varied from 1 min 50 sec to 20 min 10 sec (mean 5 min 50 sec) for the cases, and
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39 from 59 sec to 20 min 44 sec (mean 5 min 30 sec) for the controls; p=0.377 (paired t-test). All
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41 calls, both cases and controls, were slightly provider-driven, with a ratio of telenurse/caller
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43 talk of 1.31 (SD 0.24) in the cases, versus a ratio of 1.28 (SD 0.30) in the controls (p=0.424).
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51 Analysis of actual communication showed how telenurses asked more *open-ended medical*
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53 *questions* in the control calls (mean 9.6, SD 4.5) than in the case calls (mean 2.6, SD 3.0),
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55 p<0.001. The use of *back-channel response* e.g. indicator or sustained interest, attentive
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3 listening or encouragement emitted by the telenurses when not holding the speaking floor
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5 (Mmmm-huh; yeah; go on) by telenurses was also significantly more common in the controls
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7 (mean 28.8, SD 11.3) than in the cases (mean 15.9, SD 10.1) ($p=0.001$); see Table I. When
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9 analysing the callers' communication, the analysis showed that callers provided statistically
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11 significantly more *medical information* (mean 54.9, SD 13.2) in the controls than in the cases
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13 (mean 38.9, SD 13.4), $p=0.001$, and that callers in the cases gave more lifestyle information
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15 (mean 5.6, SD 5.4) than those in the controls (1.4, SD 3.6), $p=0.001$; see Table II.

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--/please insert Table I and Table II about here/--

In the cases, telenurses were significantly more prone to *check their own understanding* (mean 8.1, SD 5.1) than in the controls (mean 1.9, SD 2.6); $p<0.001$. Checking for one's own understanding involves utterances like "*Did you say the chest pain started while walking in stairs?*" Furthermore, communication analysis also showed that telenurses made more *statements of agreement* in the cases (mean 15.6, SD 7.6) than in the controls (mean 2.4, SD 3.9) $p<0.001$. Typical examples of *statements of agreement* are "*You're probably right; there's nothing to worry about*". Telenurses were reluctant to follow up on callers understanding to given advice (*ask for callers understanding*) in both cases (mean 0.4, SD 1.7) as well as in controls (mean 0.3 SD 0.8).

Discussion

The present comparison of malpractice claimed calls in the context of SHD versus matched controls showed that the telenurses in the control calls used more open-ended questions and back-channel response, and were hence provided with more medical

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3 information by the callers than were the telenurses in the cases. These results show that the
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5 use of open-ended questions and back-channel response by telenurses seems to encourage
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7 callers to freely narrate their problem and reason for calling. This is in line with previous
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9 studies in other contexts^{42, 43, 43, 44} showing that the use of open-ended questions might
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11 contribute to improved patient safety and reduce patient complaints.⁴⁵ Interestingly, the use of
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13 open-ended questions did not increase the total time of the calls, as is also shown by Stewart
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15 et al.⁴⁶ However, using open-ended questions significantly increased the amount of medical
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17 information the callers provided the telenurses with. This likely contributes to increased
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19 safety, since it gives telenurses a better base for their decisions.^{32, 47, 48} Telephone triage and
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21 counselling is complicated and perhaps the most vulnerable part of nursing and out-of-hours
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23 care^{3, 5, 11, 25}. Telephone nursing is by Greenberg¹³ describes as a dynamic and goal-oriented
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25 process consisting of gathering information, cognitive processing, and output. Greenberg
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27 suggests that telenurses training and practice should emphasize telenurses information
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29 gathering, enabling telenurses to use this information, both implicit and explicit information,
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31 to identify client needs. And as shown in the previous study, usage of open-ended questions
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33 might increase the information callers provide to telenurses. Hence, this could be seen as a
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35 way of safety-netting. Healthcare professionals' use of open-ended questioning is also a
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37 cornerstone in patient-centred communication. Typical of bio-medical communication, on the
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39 other hand, is the use of closed-ended questions and giving instructions without following up
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41 on the patient's understanding.⁴⁹ This communication pattern was found in the present
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43 malpractice claimed cases. Neither in the cases nor the control calls the telenurses followed up
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45 on callers understanding to given advice (*ask for callers understanding*). This lack of follow
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47 up on callers understanding to advice given should be regarded as a clear threat to patient
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49 safety since it does not matter how correct the telenurses advices are if the caller do not
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51 understand what to do. A Norwegian study has shown how 99 out of 100 callers stated that
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3 they had understood the telenurses advice, but when comparing to the telephone records, the
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5 observed agreement was 82.6%⁵⁰. As suggested by Hansen and Hunsaker⁵⁰ telenurses should
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7 ask callers to repeat the advices at the end of the call in order to ensure callers understanding.
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9 This is also a way of safety-netting. Using safety net instruction has shown to be an important
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11 factor for quality of communication in telephone advice nursing⁵¹ As suggested by Derkx et al
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14⁵² training for telenurses should focus more on patient-centred communication with active
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16 listening, active advising and telenurses structuring the call.
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20 Expressions of concern were quite common among callers in both the cases
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22 (mean 6.0, SD 4.5) and the controls (mean 3.7, SD 4.3) $p=0.071$, although we had expected
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24 there to be more expressions of concern among the cases. Price's³² study in a paediatric
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26 setting suggests that it is important that parents' concern is taken seriously, since they are
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28 often good judges of their child's condition. Hence, taking an adequate history and listening
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30 to the patient's story are again all-important issues.³² Studies^{26,50} has shown that callers have
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32 a great credence in telenurses advices, and despite not feeling quite confident regarding the
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34 advice, the callers followed them.⁵⁰ Hence, telenurses authority could in a way be regarded as
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36 a threat to patient safety. However, in contradiction to this telenurses has also described how
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38 they sometimes actually *expected* the callers to make the final decision regarding given
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40 advice. Situations leading to a malpractice claims were described as when callers were
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42 advised to contact emergency services if they felt their conditions had worsened and not
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44 heeded this advice⁵³, as they might for instance not know what signs and symptoms that
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46 indicated worsening. Since telenurses have a huge responsibility for the caller and a large
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48 impact on caller care seeking behaviour it is outmost important that telenurses possess both
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50 good communicative and medical skills in order to meet the caller's needs, and clarify and
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52 motivate the advice. It is therefore important for telenurses to obtain feedback on their triage
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3 to improve accuracy.⁵⁴ In Norway, telenurses both assess patients by telephone and actually
4 meet them when they attend the clinic, and this way of organising the care may contribute to
5 improved feedback and learning for telenurses.⁵⁴ In Sweden however, telenurses work in call-
6 centres with no face-to-face contact with callers/patients and are not given this opportunity for
7 feed-back on their assessments. In a recent study⁵³ telenurses were interviewed regarding
8 their own experiences of factors which may have contributed to the malpractice claims. The
9 study describes the importance of experience and how inexperience, as a telenurses,
10 contributed to the malpractice claims. Today there is no specialist education for telenurses in
11 Sweden, but the need of such has been raised in previous studies.^{24, 29, 55}

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24 Among the control calls, telenurses were more prone to use ***Facilitation and***
25 ***patient activation*** (p=0.003), see Table 1, which include asking for callers opinion,
26 understanding to advice given and using back-channel response to show interest in what the
27 caller is saying. A Dutch study⁵² suggests that telenurses should use these communicative
28 strategies to improve the quality of communication. The use of patient activation strategies
29 has also been shown to increase concordance.⁵⁶ Achieving concordance is essential for callers
30 to follow through with the advice provided by the telenurses.²⁶ This finding is puzzling – i.e.,
31 why do the telenurses in the cases use less patient activating strategies? – and needs to be
32 investigated in further studies.

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35 In the calls subjected to malpractice claims, telenurses in the cases checked their
36 own understanding more often than those in the controls, with questions like “*So you’ve had*
37 *this chest pain for five hours?*” These results could be signs of insecurity or the result of a
38 conscious strategy to assure correctness? Further analysis using an in-depth qualitative
39 analysis of this data is necessary to answer this question.

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3 Interestingly, there were no significant differences between the cases (mean 1.2,
4 SD 2.8) and the controls (mean 0.7, SD 1.8) $p=0.515$ regarding callers' requests for service,
5 e.g. referral to a doctor. These results show that callers in the cases might not have been aware
6 of the severity of their medical condition. In the cases, there was a tendency of significance
7 regarding telenurses' expressions of reassurance (mean 4.3, SD 5.7) compared to the controls
8 (mean 1.0, SD. 2.2), $p=0.01$. In a previous study²¹ analysing communication in the
9 malpractice claimed calls, there was a significant relationship between callers' expressions of
10 concern and telenurses' utterances of reassurance during calls.
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21 The findings from the present study might be used for educational interventions
22 in clinical settings, as well as for in-house training for telenurses. However, in addition to the
23 present RIAS analysis³⁶, more in-depth qualitative analyses –of for instance turn-taking and
24 nurses' responses to callers' cues – should be valuable. Further research on larger samples
25 might include studies of well-functioning calls and the communication patterns in them.
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36 **Limitations**

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38 The present study includes a small sample of calls, in a Swedish context. However, it
39 consisted of a total sample of authentic malpractice claimed calls during the time period, and
40 matched controls. Many cases with errors do not end up as malpractice cases and might
41 thereby not be included in the study. However due to Swedish regulations, it was not possible
42 to control for the outcome of the control calls, control calls might contain unknown errors.
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44 Also due to Swedish regulations, managers in charge at SHD are responsible for the recorded
45 calls, and despite several reminders sent from the research group, it was not possible to
46 retrieve control call for three of the cases. The RIAS coding of the calls was conducted by
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3 trained coders, the first and last author, both RN's with previous experience of telephone
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5 advice nursing. Eighteen of the 52 calls were double coded to assure inter-rater reliability and
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7 ICC ranged from 0.76-0.91.
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10 11 12 13 **Conclusions**

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16 The present study shows that telenurses in malpractice claimed calls used more closed-ended
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18 questioning compared to those in control calls, who used more open-ended questioning and
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20 back-channel response, which provided them with richer medical descriptions and more
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22 information from the caller. Hence, using open-ended questions and telenurses encouraging
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24 callers to freely describe their problems and reason for calling should be taught and used in
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26 clinical practice. These communicative techniques seems important in addition to solid
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28 medical and nursing competence and sound decision aid systems. Further studies including
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30 telenurses subjected to a malpractice claim, using qualitative methods might deepen the
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32 understanding of why telenurses were prone to use close-ended questions.
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40 41 **Ethical considerations**

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43 The study was approved by the Regional Ethical Review Board in Uppsala (na.2010/008) and
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45 the Swedish National Board of Health and Welfare (NBHW) (act number 3.1 35689/2010).
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Contributorship statement

- AE contributed to planning and designing study, data collection, data analysis and drafting of manuscript
- ME contributed to planning and designing study, data analysis and drafting of manuscript
- UWS contributed to planning and designing study and drafting of manuscript
- IKH contributed to planning and designing study, data analysis and drafting of manuscript

Data Sharing Statement: No additional data available

Competing interests: There are no competing interests for authors of this study

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Table I

Comparison of telenurses' communication in the group cases versus control, presented as percentage of total utterances

Nurse talk	Case n=26	Control n=26	<i>p</i> -value ¹
Composite category/category	Mean (SD)	Mean (SD)	
Data gathering – biomedical	17.5 (10.2)	24.7 (10.6)	0.032
a) Closed - medical question	9.5 (5.5)	12.8 (7.8)	0.112
b) Closed - therapeutic question	2.3 (3.0)	0.9 (1.9)	0.058
c) Closed - other question	2.3 (2.5)	0.5 (0.3)	<i>p</i><0.001
d) Open - medical question	2.6 (3.0)	9.6 (4.5)	<i>p</i><0.001
e) Open - therapeutic question	0.2 (0.6)	0.9 (1.3)	0.013
f) Open - other question	0.2 (0.6)	0.4 (0.7)	0.575
g) Bid for repetition	0.3 (0.7)	0.1 (0.5)	0.225
Facilitation and patient activation	25.8 (11.7)	35.3 (11.4)	0.003
a) Ask for opinion	1.1 (1.5)	0.3 (0.7)	0.034
b) Ask for permission	0.3 (0.8)	0.08 (0.04)	0.225
c) Ask for reassurance	0	0	1.0
d) Ask for callers understanding	0.4 (1.7)	0.3 (0.8)	0.575
e) Back-channel	15.9 (10.1)	28.8 (11.3)	0.001
f) Check own understanding	8.1 (5.1)	1.9 (2.6)	<i>p</i><0.001
Rapport-building/positive	16.5 (7.8)	14.7 (8.6)	0.341

a) Laugh	0.1 (0.5)	1.1 (3.6)	0.116
b) Express Approval	0.7 (1.1)	0.5 (1.1)	0.470
c) Give Compliments	0	0	1.0
d) Agree	15.6 (7.6)	2.4 (3.9)	p<0.001
Rapport-building/positive	6.0 (6.1)	2.9 (3.3)	0.024
a) Express empathy	0.5 (0.9)	0.8 (1.3)	0.433
b) Legitimize	0.6 (1.4)	0.2 (0.6)	0.161
c) Express concern	0.3 (0.8)	0.9 (1.2)	0.030
d) Reassures	4.3 (5.7)	1.0 (2.2)	0.010
e) Make partnership statement	0.3 (0.8)	0	0.109
f) Self-disclosure	0.02 (0.1)	0	0.317

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) and composite categories with a tendency toward significance ($p=0.01$) are presented. Statistically significant values are marked with bold text.

Table II

Comparison of callers' communication in the group cases versus control, presented as percentage of total utterances

Caller talk	Case n=26	Control n=26	<i>p-value</i> ¹
Composite category/category	Mean (SD)	Mean (SD)	
Information giving – biomedical	47.4 (16.6)	60.7 (13.7)	0.003
a) Give medical information	38.9 (13.4)	54.9 (13.2)	0.001
b) Give therapeutic information	5.9 (7.4)	4.4 (6.9)	0.478
c) Give other information	3.7 (3.6)	1.4 (2.1)	0.006
Information giving – lifestyle/psychological	6.0 (6.1)	2.0 (3.7)	0.002
a) Give information – lifestyle	5.6 (5.4)	1.4 (3.6)	0.001
b) Give information – psychological	0.4 (1.4)	0.6 (1.2)	0.401
Rapport-building/emotional	6.3 (4.6)	3.7 (4.3)	0.058
a) Express empathy	0.6 (0.3)	0	0.317
b) Legitimize	0	0	1.0
c) Express concern	6.0 (4.5)	3.7 (4.3)	0.071
d) Reassure	0.2 (0.9)	0	0.180

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) are presented, and the category Rapport-building/emotional was of interest based on a previous study. Statistically significant values are marked with bold text.

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5 **TITLE PAGE**
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8 **A COMPARISON OF CALLS SUBJECTED TO A MALPRACTICE CLAIM VERSUS**
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10 **“NORMAL CALLS” WITHIN THE SWEDISH HEALTHCARE DIRECT – A CASE**
11
12 **CONTROL STUDY**
13

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41 Malpractice claims within the Swedish Health Care Direct
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43 *Key words: Telenursing, Patient Safety, Communication, Medical Errors*
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Abstract

Objectives: The purpose of this study is to compare communication patterns in calls subjected to a malpractice claim with matched controls.

Setting: In many countries, telephone advice nursing is patients' first contact with healthcare. Telenurses' assessment of callers' symptoms and needs are based on verbal communication only, and problems with over- and under-triage have been reported.

Participants: A total sample of all reported medical errors (n=33) during the period 2003-2010 within Swedish Healthcare Direct was retrieved. Corresponding calls were thereafter identified and collected as sound files from the manager in charge at the respective call centres. For technical reasons, calls from four of the cases were not possible to retrieve. For the present study, matched control calls (n=26) based on the patient's age, gender and main symptom presented by the caller were collected

Results: Male patients were in majority (n=16), and the most common reasons for calling were abdominal pain (n=10) and chest pain (n=5). There were statistically significant differences between the communication in the cases and controls: telenurses used fewer open-ended medical questions ($p<0.001$) in the cases compared to the control calls; callers provided telenurses with more medical information in the control calls compared to the cases ($p=0.001$); and telenurses used more facilitation and patient activation activities in the control calls ($p=0.034$), such as back-channel response ($p=0.001$), compared to the cases.

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3 **Conclusions:** The present study shows that telenurses in malpractice claimed calls used more
4 closed-ended questioning compared to those in control calls, who used more open-ended
5 questioning and back-channel response, which provided them with richer medical descriptions
6 and more information from the caller. Hence, these communicative techniques are important
7 in addition to solid medical and nursing competence and sound decision aid systems.
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Article summary

Strengths and limitations of this study

- This is the first study to compare authentic calls, subjected to malpractice claims, to matched controls e.g. normal calls to Sweden's national telephone advice nursing service (SHD)
- Open-ended medical questions and back-channel response e.g. attentive listening from telenurses were more common in control calls, which indicate that these strategies might enhance patient safety in telephone advice nursing services.
- Using open-ended medical questions do not lengthen call-time
- The present study includes a small sample of calls (n=52), in a Swedish context. However, it consisted of a total sample of authentic malpractice claimed calls during the time period, and matched controls.

A comparison of calls containing medical errors versus “normal calls” within the Swedish Healthcare Direct – a case control study

Introduction

Telephone advice nursing plays a crucial role in healthcare organizations through the assessment of callers' symptoms and the steering of patient flows to the right level of care. These services are complex, and some studies have shown that they may compromise patient safety.^{1,2} AAACN (2007) has defined telephone advice nursing as: “Telephone advice nursing, or in short “telenursing” including telephone triage, is defined as the practice of providing “a component of telephone nursing practice that focuses on assessment, prioritization, and referral to the appropriate levels of care” and “identifying the nature and urgency” of a caller's or patient's needs “. Telephone advice nursing, in Sweden performed solely by registered nurses (RNs), here referred to as telenurses, has been described as the most vulnerable form of out-of-hours healthcare.³⁻⁶ However, it should be noted that the competence and education in telenursing differ between countries. In UK, for instance, caller first has to talk to a so called call-handler, how then might transfer the call to a registered nurse, if deemed appropriate. Among the problems with the service, over- and under-triage have been described in several international studies.^{2,7-9} A systematic review¹⁰ showed that as much as 10% of telephone advice was unsafe. The studies included in the review that had used simulated patients showed that an average of 50% of the contacts was unsafe. In many countries telephone advice nursing is the patient's first contact with healthcare, and the service entails a large number of patient contacts.¹¹⁻¹³ Given this large number, the effects of unsafe telephone advice nursing could be substantial on a population level.¹⁰

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3 Telephone advice nursing is a growing service in many countries (the UK, the
4 US, Canada, Sweden, Denmark and the Netherlands), with the aim to provide increased
5 accessibility to qualified healthcare advice and to rationalize limited healthcare resources. The
6 service in Sweden, called Swedish Healthcare Direct (SHD), is staffed by RNs who
7 independently triage callers' need of care, give self-care advice and/or refer the caller to an
8 appropriate level of care, with the assistance of a computerized decision support system
9 (CDSS).^{14 15} The CDSS used in Sweden could be entered either by symptom or by diagnosis,
10 covering various symptoms and conditions among children, adolescents, adults and older
11 people. It suggests key-questions based on the caller's symptom, and severe main symptoms
12 are regarded as acute until proven not, e.g. chest-pain. The recommendation levels within the
13 CDSS vary from ambulance dispatch to self-care advice¹⁶. The CDSS in used in Sweden is
14 constantly revised by medical experts and the users (telenurses) have the possibility to report
15 problems with the CDSS to the system developers. The outcome of telenurses triage of callers
16 has in international studies varied from 58% accuracy¹ to 97.6%¹⁶. There is however, also
17 another factor to consider in addition to the accuracy of the CDSS, namely the human factor.
18 No matter how accurate the CDSS is if the users do not use the system as intended. Several
19 studies¹⁷⁻²⁰ have described both how telenurses in Sweden¹⁷ as well as in the UK^{18,19} stated
20 that they did not always use the CDSS as intended. As their knowledge about the CDSS
21 increase, they are able to select the "proper" main-symptom to enter, enabling them to choose
22 a route through the software that matches their own understanding of the symptoms and its
23 cause, hence using the CDSS to confirm their decisions rather than excluding severe
24 symptoms¹⁸. In our previous study of malpractice claimed calls²¹, the root-cause analysis
25 performed by the National Board of Health and Welfare (NBHW), showed that the most
26 common reasons (please note that more than one reason could be identified for the same
27 case) for the malpractice claims were communication failure (n=35). These communicative

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3 failures consisted of: failure to listen to the caller (n=12), communication failure (n=11) and
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5 telenurses asking the caller too few questions (n=10). The investigation also showed how
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7 telenurses in seven cases failed to follow the guidelines of the CDSS, or did not use the CDSS
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9 at all. The NBHW's investigations also showed how deficiency in the CDSS (n=5)
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11 contributed to the cases ²¹.

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14 The service in Sweden is provided by 33 call centres ²², located all over the
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16 country and connected through a network which provides, e.g., CDSS and in-house education.
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18 Currently 1,100 telenurses are employed in this service, which handled over five million calls
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20 in 2013²³. They are subjected to many challenging demands, including employers' demands
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22 for efficiency ¹⁴ in addition to the correct and accurate triaging of callers' need of care.
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24 Communication is hence essential in telephone advice nursing. Not only do telenurses need to
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26 ask accurate questions; they also need to use active listening and, through their
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28 communication, create a trusting and caring relationship with the caller.²⁴⁻²⁶ These are factors
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30 that have been shown to correlate with positive health effects. ²⁷ To sum up, the telenurses
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32 have a demanding job, as they are expected to provide expert, individualized care based solely
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34 on verbal communication, while also acting as gatekeepers for the healthcare sector.²⁵ Their
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36 professional practice includes great risks of making the wrong assessments, and subsequently
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38 be subjected to malpractice claims.

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43 We have previously investigated malpractice claimed calls in SHD²¹. When a
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45 patient in Sweden is exposed to, or subjected to a medical error, a malpractice claim is filed
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47 with the National Board of Health and Welfare (NBHW), by the health-care provider or the
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49 patient. A medical error can be defined as "the failure of a planned action to be completed as
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51 intended or the use of a wrong plan to achieve an aim"²⁸. In an investigation of reported
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53 malpractice claimed calls (n=33) in the context of telephone advice nursing in Sweden ²¹,
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55 communication failure was found to be the most common reason for these errors, as described
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3 above. The outcome for these malpractice claims was severe; 13 of the patients died and 12
4 were admitted to ICU. The study showed that communication problems (n=35) was the most
5 commonly described reason for the errors to occur, according what to the NBHW's
6 investigation. Hence, the telenurses in these calls asked the callers too few questions and
7 failed to listen to them. Safety risks in telephone advice nursing might be related to gathering
8 partial information from callers, communicating with callers with language problems, or
9 callers behaving in a way that hinders communication (such as being very angry); but the
10 greatest risk seemed to be uncertainty due to the inability to see the caller in person.²⁹ Another
11 safety risk within telephone advice nursing is not talking directly with the patient in need of
12 care.²¹ Second-hand communication has also been shown to contribute to increased safety
13 risks in the context of emergency dispatch calls.³⁰

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30 Fernald et al.³¹ have shown that as much as 70% of all medical errors within
31 primary healthcare are related to communication problems. Communication failure has also
32 been shown to be the most common reason for patient safety risks, as well as the most
33 common cause of adverse events.^{21, 32-35} This likely also holds true for telephone advice
34 nursing services, in which the assessment of healthcare needs is based solely on verbal
35 communication. When searching the literature, there are no descriptions found of how
36 communication in telephone advice nursing should be conducted to achieve safe
37 communication, and what communicative patterns characterized safe and more unsafe calls.
38 We believe that the potential differences found when calls subjected to a malpractice claim
39 are compared to matched controls might shed light on both safe and unsafe communication
40 practices via telephone.
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3 The aim of the present study was to compare communication patterns in calls
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5 subjected to a malpractice claim with matched controls.
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10 11 **Methods**

12 13 **Design**

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17 The study used a case-control design.
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20 21 **Sample**

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23 A total sample of all reported medical errors (n=33) during the period 2003-2010 within
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25 Swedish Healthcare Direct was retrieved as text documents from the National Board of Health
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27 and Welfare (NBHW), responsible for such investigations. Corresponding calls were
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29 thereafter identified and collected as sound files from the manager in charge at the respective
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31 call centres. In Sweden, all calls to SHD are recorded and stored as a sound file in a call data
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33 base, connected to the patient record for a minimum of ten years. The managers in charge are
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35 responsible for these stored calls. For technical reasons, calls from four of the cases were not
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37 possible to retrieve. The 29 retrieved cases' calls were analysed, with the aim to describe all
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39 malpractice claims regarding SHD during 2003-2010, regarding the communication between
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41 telenurses and callers. These results are presented elsewhere²¹. For the present study, matched
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43 control calls based on the patient's age, gender and main symptom presented by the caller
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45 were collected from the call databases at SHD, by the managers in charge, as the researchers
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47 were not allowed direct access to the database due to ethical regulations. The control calls
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49 sound files were sent to the researchers via USB memory in registered letters. For three of the
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51 cases, it was not possible for the respective managers in charge to find matched controls in
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53 their call database, despite the large numbers of calls made to SHD every year. Several
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reminders were sent to the managers in charge in an attempt to retrieve control calls. The three cases which the managers were unable to find controls to were excluded from the present study. Hence, the present study consists of 26 cases and 26 matched controls, making a total of 52 calls. The cases and controls were spread over a period of time from the introduction of SHD in 2003 until 2010 and fielded by different telenurses. The 26 cases and 26 matched controls each contained 16 male and 10 female patients. Patient age varied from 2 years to 85 years; mean age 44 years, SD 23.7. The most common reasons for calling were abdominal pain (n=10), chest pain (n=5), dizziness (n=3) and breathing problems (n=2).

Data analysis

All authentic calls were analysed using the Roter Interaction Analysis System (RIAS),³⁶ a commonly used instrument for describing provider-patient communication in various medical contexts. In RIAS coding, all communication between the telenurses and the caller is divided into small units defined as “utterances”, e.g. the smallest speech segment to which a classification can be assigned. Coding is performed directly from sound files. During analysis, the authentic communication between telenurses and callers was coded as frequency of utterances and of statements, and as a proportion of statements in a given category relative to all nurse/caller statements during the call. Each single utterance is later categorised into one of the 41 exhaustive and exclusive RIAS categories. The categories are combined into composite categories according to the developers of the RIAS³⁶. In the previous study of the malpractice claimed calls²¹, we have focused the result on 11 of the 41 categories, identifying patient-centred behaviour such as telenurses usage of open-ended questions and follow-up on callers understanding according guidelines³⁷⁻³⁹. Several of the categories were not present in the calls, probably explained by the context of the study. Analysis began with listening to the calls in

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3 order to attain an understanding of them. Calls were then analysed based on the
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5 recommendations of the RIAS manual ³⁶, and utterances were identified and placed into one
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7 of the categories, see Table 1 and 2. The control calls were analysed during autumn 2013. All
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9 coding was conducted by the first author (AE) while the last authors (IKH) double coded 18
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11 calls. Inter-rater reliability calculation, using intra-class correlation (ICC), ranged from 0.76-
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13 0.91. Both coders are trained in RIAS coding and are experienced telenurses. Data were
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15 imported into IBM SPSS Statistics 20 for statistical analysis. Differences in communication
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17 between cases and matched controls were compared using the Wilcoxon Signed Rank Test.⁴⁰
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19 To control/adjust for differences in call length between the cases and matched controls,
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21 utterances in a category are presented as percentage of total utterances (i.e., utterances in the
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23 category divided by all utterances made by the caller or telenurses). Comparison between
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25 cases and matched controls was performed in all RIAS categories (n=49) and composite
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27 categories (n=13). Bonferroni adjustment was used with an adjusted p-value of 0.001 for all
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29 statistical tests to control for type-1 error.⁴¹
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35 Results

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37 Call length varied from 1 min 50 sec to 20 min 10 sec (mean 5 min 50 sec) for the cases, and
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39 from 59 sec to 20 min 44 sec (mean 5 min 30 sec) for the controls; p=0.377 (paired t-test). All
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41 calls, both cases and controls, were slightly provider-driven, with a ratio of telenurse/caller
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43 talk of 1.31 (SD 0.24) in the cases, versus a ratio of 1.28 (SD 0.30) in the controls (p=0.424).
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51 Analysis of actual communication showed how telenurses asked more *open-ended medical*
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53 *questions* in the control calls (mean 9.6, SD 4.5) than in the case calls (mean 2.6, SD 3.0),
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55 p<0.001. The use of *back-channel response* e.g. indicator or sustained interest, attentive
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3 listening or encouragement emitted by the telenurses when not holding the speaking floor
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5 (Mmmm-huh; yeah; go on) by telenurses was also significantly more common in the controls
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7 (mean 28.8, SD 11.3) than in the cases (mean 15.9, SD 10.1) ($p=0.001$); see Table I. When
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9 analysing the callers' communication, the analysis showed that callers provided statistically
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11 significantly more *medical information* (mean 54.9, SD 13.2) in the controls than in the cases
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13 (mean 38.9, SD 13.4), $p=0.001$, and that callers in the cases gave more lifestyle information
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15 (mean 5.6, SD 5.4) than those in the controls (1.4, SD 3.6), $p=0.001$; see Table II.

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--/please insert Table I and Table II about here/--

In the cases, telenurses were significantly more prone to *check their own understanding* (mean 8.1, SD 5.1) than in the controls (mean 1.9, SD 2.6); $p<0.001$. Checking for one's own understanding involves utterances like "*Did you say the chest pain started while walking in stairs?*" Furthermore, communication analysis also showed that telenurses made more *statements of agreement* in the cases (mean 15.6, SD 7.6) than in the controls (mean 2.4, SD 3.9) $p<0.001$. Typical examples of *statements of agreement* are "*You're probably right; there's nothing to worry about*". Telenurses were reluctant to follow up on callers understanding to given advice (*ask for callers understanding*) in both cases (mean 0.4, SD 1.7) as well as in controls (mean 0.3 SD 0.8).

Discussion

The present comparison of malpractice claimed calls in the context of SHD versus matched controls showed that the telenurses in the control calls used more open-ended questions and back-channel response, and were hence provided with more medical

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3 information by the callers than were the telenurses in the cases. These results show that the
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5 use of open-ended questions and back-channel response by telenurses seems to encourage
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7 callers to freely narrate their problem and reason for calling. This is in line with previous
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9 studies in other contexts^{42, 43, 43, 44} showing that the use of open-ended questions might
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11 contribute to improved patient safety and reduce patient complaints.⁴⁵ Interestingly, the use of
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13 open-ended questions did not increase the total time of the calls, as is also shown by Stewart
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15 et al.⁴⁶ However, using open-ended questions significantly increased the amount of medical
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17 information the callers provided the telenurses with. This likely contributes to increased
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19 safety, since it gives telenurses a better base for their decisions.^{32, 47, 48} Telephone triage and
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21 counselling is complicated and perhaps the most vulnerable part of nursing and out-of-hours
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23 care^{3, 5, 11, 25}. Telephone nursing is by Greenberg¹³ describes as a dynamic and goal-oriented
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25 process consisting of gathering information, cognitive processing, and output. Greenberg
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27 suggests that telenurses training and practice should emphasize telenurses information
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29 gathering, enabling telenurses to use this information, both implicit and explicit information,
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31 to identify client needs. And as shown in the previous study, usage of open-ended questions
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33 might increase the information callers provide to telenurses. Hence, this could be seen as a
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35 way of safety-netting. Healthcare professionals' use of open-ended questioning is also a
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37 cornerstone in patient-centred communication. Typical of bio-medical communication, on the
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39 other hand, is the use of closed-ended questions and giving instructions without following up
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41 on the patient's understanding.⁴⁹ This communication pattern was found in the present
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43 malpractice claimed cases. Neither in the cases nor the control calls the telenurses followed up
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45 on callers understanding to given advice (*ask for callers understanding*). This lack of follow
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47 up on callers understanding to advice given should be regarded as a clear threat to patient
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49 safety since it does not matter how correct the telenurses advices are if the caller do not
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51 understand what to do. A Norwegian study has shown how 99 out of 100 callers stated that
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3 they had understood the telenurses advice, but when comparing to the telephone records, the
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5 observed agreement was 82.6%⁵⁰. As suggested by Hansen and Hunsaker⁵⁰ telenurses should
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7 ask callers to repeat the advices at the end of the call in order to ensure callers understanding.
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9 This is also a way of safety-netting. Using safety net instruction has shown to be an important
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11 factor for quality of communication in telephone advice nursing⁵¹ As suggested by Derkx et al
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14⁵² training for telenurses should focus more on patient-centred communication with active
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16 listening, active advising and telenurses structuring the call.
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20 Expressions of concern were quite common among callers in both the cases
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22 (mean 6.0, SD 4.5) and the controls (mean 3.7, SD 4.3) $p=0.071$, although we had expected
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24 there to be more expressions of concern among the cases. Price's³² study in a paediatric
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26 setting suggests that it is important that parents' concern is taken seriously, since they are
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28 often good judges of their child's condition. Hence, taking an adequate history and listening
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30 to the patient's story are again all-important issues.³² Studies^{26,50} has shown that callers have
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32 a great credence in telenurses advices, and despite not feeling quite confident regarding the
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34 advice, the callers followed them.⁵⁰ Hence, telenurses authority could in a way be regarded as
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36 a threat to patient safety. However, in contradiction to this telenurses has also described how
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38 they sometimes actually *expected* the callers to make the final decision regarding given
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40 advice. Situations leading to a malpractice claims were described as when callers were
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42 advised to contact emergency services if they felt their conditions had worsened and not
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44 heeded this advice⁵³, as they might for instance not know what signs and symptoms that
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46 indicated worsening. Since telenurses have a huge responsibility for the caller and a large
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48 impact on caller care seeking behaviour it is outmost important that telenurses possess both
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50 good communicative and medical skills in order to meet the caller's needs, and clarify and
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52 motivate the advice. It is therefore important for telenurses to obtain feedback on their triage
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3 to improve accuracy.⁵⁴ In Norway, telenurses both assess patients by telephone and actually
4 meet them when they attend the clinic, and this way of organising the care may contribute to
5 improved feedback and learning for telenurses.⁵⁴ In Sweden however, telenurses work in call-
6 centres with no face-to-face contact with callers/patients and are not given this opportunity for
7 feed-back on their assessments. In a recent study⁵³ telenurses were interviewed regarding
8 their own experiences of factors which may have contributed to the malpractice claims. The
9 study describes the importance of experience and how inexperience, as a telenurses,
10 contributed to the malpractice claims. Today there is no specialist education for telenurses in
11 Sweden, but the need of such has been raised in previous studies.^{24, 29, 55}

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24 Among the control calls, telenurses were more prone to use *Facilitation and*
25 *patient activation* (p=0.003), see Table 1, which include asking for callers opinion,
26 understanding to advice given and using back-channel response to show interest in what the
27 caller is saying. A Dutch study⁵² suggests that telenurses should use these communicative
28 strategies to improve the quality of communication. The use of patient activation strategies
29 has also been shown to increase concordance.⁵⁶ Achieving concordance is essential for callers
30 to follow through with the advice provided by the telenurses.²⁶ This finding is puzzling – i.e.,
31 why do the telenurses in the cases use less patient activating strategies? – and needs to be
32 investigated in further studies.

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35 In the calls subjected to malpractice claims, telenurses in the cases checked their
36 own understanding more often than those in the controls, with questions like “*So you’ve had*
37 *this chest pain for five hours?*” These results could be signs of insecurity or the result of a
38 conscious strategy to assure correctness? Further analysis using an in-depth qualitative
39 analysis of this data is necessary to answer this question.

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Interestingly, there were no significant differences between the cases (mean 1.2, SD 2.8) and the controls (mean 0.7, SD 1.8) $p=0.515$ regarding callers' requests for service, e.g. referral to a doctor. These results show that callers in the cases might not have been aware of the severity of their medical condition. In the cases, there was a tendency of significance regarding telenurses' expressions of reassurance (mean 4.3, SD 5.7) compared to the controls (mean 1.0, SD. 2.2), $p=0.01$. In a previous study²¹ analysing communication in the malpractice claimed calls, there was a significant relationship between callers' expressions of concern and telenurses' utterances of reassurance during calls.

The findings from the present study **might** be used for educational interventions in clinical settings, as well as for in-house training for telenurses. However, in addition to the present RIAS analysis³⁶, more in-depth qualitative analyses –of for instance turn-taking and nurses' responses to callers' cues – should be valuable. Further research on larger samples might include studies of well-functioning calls and the communication patterns in them.

Limitations

The present study includes a small sample of calls, in a Swedish context. However, it consisted of a total sample of authentic malpractice claimed calls during the time period, and matched controls. **Many cases with errors do not end up as malpractice cases and might thereby not be included in the study. However due to Swedish regulations, it was not possible to control for the outcome of the control calls, control calls might contain unknown errors. Also due to Swedish regulations, managers in charge at SHD are responsible for the recorded calls, and despite several reminders sent from the research group, it was not possible to retrieve control call for three of the cases. The RIAS coding of the calls was conducted by**

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3 trained coders, the first and last author, both RN's with previous experience of telephone
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5 advice nursing. Eighteen of the 52 calls were double coded to assure inter-rater reliability and
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7 ICC ranged from 0.76-0.91.
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10 11 12 13 **Conclusions**

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16 The present study shows that telenurses in malpractice claimed calls used more closed-ended
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18 questioning compared to those in control calls, who used more open-ended questioning and
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20 back-channel response, which provided them with richer medical descriptions and more
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22 information from the caller. Hence, using open-ended questions and telenurses encouraging
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24 callers to freely describe their problems and reason for calling should be taught and used in
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26 clinical practice. These communicative techniques seems important in addition to solid
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28 medical and nursing competence and sound decision aid systems. Further studies including
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30 telenurses subjected to a malpractice claim, using qualitative methods might deepen the
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32 understanding of why telenurses were prone to use close-ended questions.
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40 41 **Ethical considerations**

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43 The study was approved by the Regional Ethical Review Board in Uppsala (na.2010/008) and
44
45 the Swedish National Board of Health and Welfare (NBHW) (act number 3.1 35689/2010).
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51 52 **Acknowledgements**

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54 We would like to acknowledge all managers in charge whom contributed to data collection.
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Contributorship statement

- AE contributed to planning and designing study, data collection, data analysis and drafting of manuscript
- ME contributed to planning and designing study, data analysis and drafting of manuscript
- UWS contributed to planning and designing study and drafting of manuscript
- IKH contributed to planning and designing study, data analysis and drafting of manuscript

No additional data available**Competing interests**

None

Table I

Comparison of telenurses' communication in the group cases versus control, presented as percentage of total utterances

Nurse talk	Case n=26	Control n=26	<i>p</i> -value ¹
Composite category/category	Mean (SD)	Mean (SD)	
Data gathering – biomedical	17.5 (10.2)	24.7 (10.6)	0.032
a) Closed - medical question	9.5 (5.5)	12.8 (7.8)	0.112
b) Closed - therapeutic question	2.3 (3.0)	0.9 (1.9)	0.058
c) Closed - other question	2.3 (2.5)	0.5 (0.3)	<i>p</i><0.001
d) Open - medical question	2.6 (3.0)	9.6 (4.5)	<i>p</i><0.001
e) Open - therapeutic question	0.2 (0.6)	0.9 (1.3)	0.013
f) Open - other question	0.2 (0.6)	0.4 (0.7)	0.575
g) Bid for repetition	0.3 (0.7)	0.1 (0.5)	0.225
Facilitation and patient activation	25.8 (11.7)	35.3 (11.4)	0.003
a) Ask for opinion	1.1 (1.5)	0.3 (0.7)	0.034
b) Ask for permission	0.3 (0.8)	0.08 (0.04)	0.225
c) Ask for reassurance	0	0	1.0
d) Ask for callers understanding	0.4 (1.7)	0.3 (0.8)	0.575
e) Back-channel	15.9 (10.1)	28.8 (11.3)	0.001
f) Check own understanding	8.1 (5.1)	1.9 (2.6)	<i>p</i><0.001
Rapport-building/positive	16.5 (7.8)	14.7 (8.6)	0.341
a) Laugh	0.1 (0.5)	1.1 (3.6)	0.116
b) Express Approval	0.7 (1.1)	0.5 (1.1)	0.470
c) Give Compliments	0	0	1.0
d) Agree	15.6 (7.6)	2.4 (3.9)	<i>p</i><0.001
Rapport-building/positive	6.0 (6.1)	2.9 (3.3)	0.024
a) Express empathy	0.5 (0.9)	0.8 (1.3)	0.433
b) Legitimize	0.6 (1.4)	0.2 (0.6)	0.161
c) Express concern	0.3 (0.8)	0.9 (1.2)	0.030
d) Reassures	4.3 (5.7)	1.0 (2.2)	0.010
e) Make partnership statement	0.3 (0.8)	0	0.109
f) Self-disclosure	0.02 (0.1)	0	0.317

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) and composite categories with a tendency toward significance ($p = 0.01$) are presented. Statistically significant values are marked with bold text.

Table II

Comparison of callers' communication in the group cases versus control, presented as percentage of total utterances

Caller talk	Case n=26	Control n=26	<i>p</i> -value ¹
Composite category/category	Mean (SD)	Mean (SD)	
Information giving – biomedical	47.4 (16.6)	60.7 (13.7)	0.003
a) Give medical information	38.9 (13.4)	54.9 (13.2)	0.001
b) Give therapeutic information	5.9 (7.4)	4.4 (6.9)	0.478
c) Give other information	3.7 (3.6)	1.4 (2.1)	0.006
Information giving – lifestyle/psychological	6.0 (6.1)	2.0 (3.7)	0.002
a) Give information – lifestyle	5.6 (5.4)	1.4 (3.6)	0.001
b) Give information – psychological	0.4 (1.4)	0.6 (1.2)	0.401
Rapport-building/emotional	6.3 (4.6)	3.7 (4.3)	0.058
a) Express empathy	0.6 (0.3)	0	0.317
b) Legitimize	0	0	1.0
c) Express concern	6.0 (4.5)	3.7 (4.3)	0.071
d) Reassure	0.2 (0.9)	0	0.180

¹The Wilcoxon Signed Rank Test was used to compare the groups. All categories in the RIAS were compared; however, in the table only composite categories including statistically significant results ($p \leq 0.001$) are presented, and the category Rapport-building/emotional was of interest based on a previous study. Statistically significant values are marked with bold text.

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract (b) Provide in the abstract an informative and balanced summary of what was done and what was found
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported
Objectives	3	State specific objectives, including any prespecified hypotheses
Methods		
Study design	4	Present key elements of study design early in the paper
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection
Participants	6	<i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy (e) Describe any sensitivity analyses

Continued on next page

Results

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time <i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i> —Report numbers of outcome events or summary measures
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (b) Report category boundaries when continuous variables were categorized (c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses

Discussion

Key results	18	Summarise key results with reference to study objectives
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence
Generalisability	21	Discuss the generalisability (external validity) of the study results

Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.